

Novel Aeroservoelastic Scaled Model Design, Fabrication, and Testing, Phase I

Completed Technology Project (2018 - 2019)



Project Introduction

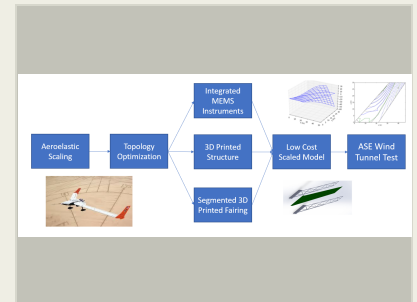
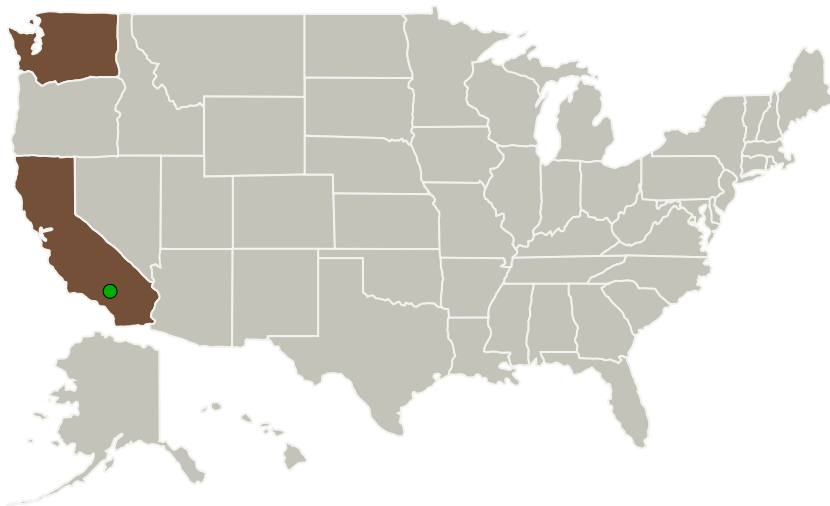
We propose the demonstration of a novel aeroservoelastic scaled model design, optimization, and fabrication approach combining aeroservoelastic scaling with a combined topology/sizing optimization to match the target structural dynamic and aeroelastic behavior. Fabrication is using 3D printing techniques (metal and plastic/elastomer), along with automated electronic assembly techniques for in-situ instrumentation. A scaled model will be designed, fabricated, and tested in a low speed wind tunnel during Phase I to demonstrate the feasibility of dramatically reducing the cost of aeroservoelastic model tests.

Anticipated Benefits

Applies to all NASA aircraft and aviation technology development programs, including subsonic, supersonic, and hypersonic vehicles.

Applies to wind tunnel and flight test validation of aeroelastic and aeroservoelastic behavior, which is relevant to any new aircraft development program.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
M4 Engineering, Inc.	Lead Organization	Industry Women-Owned Small Business (WOSB)	Long Beach, California
● Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California
University of Washington-Seattle Campus(UW)	Supporting Organization	Academia Asian American Native American Pacific Islander (AANAPISI)	Seattle, Washington

Primary U.S. Work Locations

California	Washington
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Project Transitions

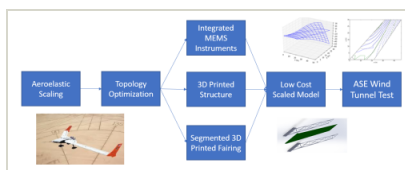
▶ **July 2018:** Project Start

✓ **August 2019:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137877>)

Images



Briefing Chart Image

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(<https://techport.nasa.gov/image/133163>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

M4 Engineering, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

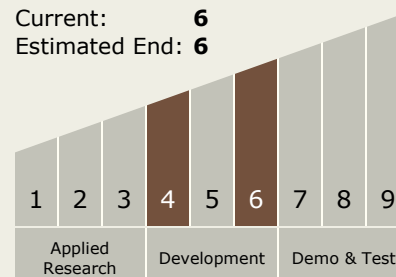
Carlos Torrez

Principal Investigator:

Myles Baker

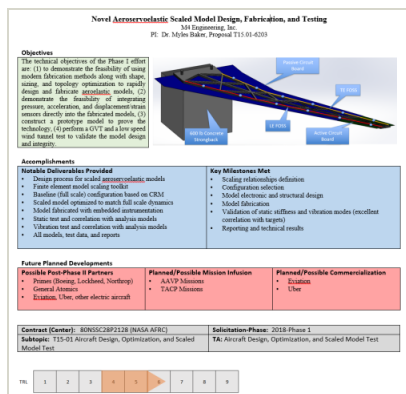
Technology Maturity (TRL)

Start: 4
Current: 6
Estimated End: 6



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Final Summary Chart Image

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(<https://techport.nasa.gov/image/134640>)

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - TX15.1 Aerosciences
 - TX15.1.3 Aeroelasticity

Target Destination

Earth